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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,201	12/05/2003	Thomas Beck	2002P06120WOUS	2440

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SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPT.
170 WOOD AVENUE SOUTH
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EXAMINER

SONG, MATTHEW J

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/729,201	Applicant(s) BECK ET AL.	
	Examiner Matthew J. Song	Art Unit 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/25/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-9 and 11-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites, “focused length” in line 5. The original specification does not provide support for a focused length. The original specification merely teaches a focal spot, note pages 8-9.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-9 and 11-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites, “focused length” in line 5. It is unclear what length is focused. The length could be the length between the source and the substrate, or the length could be length of the spot produced.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurz et al (US 6,024,792) in view of Foster et al (US 6,333,484).

Kurz et al discloses a method of manufacturing monocrystalline structures on substrates. (Abstract.) The method is an epitaxial one (col2, ln 1-10) which utilizes an energy sources having a focal point at the surface to be melted. (col 2, ln 40-67). Laser beams, electron beams and arc methods are suitable. (col 2, ln 45-60) The melted material solidifies into the monocrystalline structure. (co 15, ln 1-67). A feed material is supplied to the area to be melted and is incorporated into the monocrystalline structure of the substrate and the material is completely melted. (col 5, ln 1-67 and claim 1). The arrow in Figure 4 shows movement in a

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single direction, (col 5, ln 60-67) this reads on applicant's z direction only. The power and thus the temperature of the beam is selected to ensure dendritic growth and material are metallic superalloys (col 6, ln 10-20 and col 1, ln 5-55). Kurz et al also teaches the diameter of the laser spot is 2.5 mm (col 4, ln 60-67), this reads on applicant's focused length because the spot has a length and the spot is a laser spot, i.e. focus light. Kurz et al also teaches energy input with the energy beam is controlled in such a manner that the speed of the solidification and the temperature gradient lie in the dendritic crystalline region (col 6, ln 1-20). Kurz et al teaches a round spot in Fig 4, this reads on applicant's molten area is substantially linear, elliptical or rectangular. Kurz et al also teaches layering multiple epitaxial layers on top of each other (col 5, ln 20-35).

Kurz et al does not teach controlling a temperature of the focused length of the energy source by an optical system to determine when a next epitaxial is to be formed.

In a method of directional solidification of superalloys, note entire reference, Foster et al teaches the temperature of a weld area is controlled throughout the process in spite of added heat from the laser beam by using an optical pyrometer (col 3, ln 35-55). Foster et al also teaches a computer numerical control (CNC) controls the laser and the control means includes a vision system (col 4, ln 45-60).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Kurz et al by using the optical pyrometer and CNC control system to measure temperature and control the laser, as taught by Foster et al, to accurately control the speed of solidification and the temperature gradient within a dendritic crystalline region, thus determines when the next epitaxial layer is formed ('792 col 5, ln 20-40 and col 6, ln 10-20).

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Referring to claim 2-3, the combination of Kurz et al and Foster et al teaches laser and electron beams ('792 col 2, ln 45-55).

7. Claims 5-9, 11-13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurz et al (US 6,024,792) in view of Foster et al (US 6,333,484) as applied to claims \$\$\$ above, and further in view of Marcin et al (US 6,103,402).

The combination of Kurz et al and Foster et al teaches all of the limitations of claim 5, as discussed previously, except the size of the focused length is changed during operation.

Marcin et al teaches method of making crack free metallic articles using an energy beam, note entire reference. Marcin et al teaches incorporating a filler material into a super-alloy by the application of an energy beam. In example 1, Marcin et al teaches that a first spot power (and thus, spot temperature) and spot size were used followed by a second spot power and size. (col 7, ln 45 to col 8, ln 60). Marcin et al also teaches a powder feed was used to supply a powder to the melted areas of the substrate.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Kurz et al and Foster et al varying the size of the focus length and power to reduce material stresses transverse to the growth direction below and amount which causes cracking, as taught by Marcin et al (col 9, ln 15-35).

Referring to claims 5, 7, 8, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Kurz et al, Foster et al and Marcin et al by changing the spot size, the spot temperature (i.e. power) and to vary the material feed in

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terms of time and location since Marcin et al suggest this to form a crack free deposit with no crystal boundaries (col 3, ln 1-67).

Referring to claims 9, 12-13 and 21, the combination of Kurz et al, Foster et al and Marcin et al suggests moving the spot over the substrate in a direction and to vary the spot size to cover the width of the area transversely in relation to the direction of the movement ('170 Example 1).

Referring to claim 6, the combination of Kurz et al, Foster et al and Marcin et al teaches power density of the energy source and the spot size are a result effective variable ('170 col 3, ln 30-40 and col 2, ln 60-65). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Kurz et al, Foster et al and Marcin et al by optimizing the spot size and power to obtain the claimed profile by conducting routine experimentation of a result effective variable to achieve reduced cracking.

Response to Arguments

8. Applicant's arguments with respect to claims 1-9 and 11-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew J Song


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Examiner
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MJS
April 17, 2006


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SUPERVISORY PATENT EXAMINER
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